

CLAIMS

b *Sub G1* 1. An extended coverage ~~to a~~ sidewall automatic fire sprinkler comprising a generally tubular body with a central passageway and a central axis, one end of the passageway forming an outlet at one end of the tubular body, a closure at the one end of the tubular body at least essentially generally closing the passageway, a trigger positioned to releasably retain the closure at the outlet closing the passageway, and a deflector at a discharge end of the sprinkler, the deflector being coupled with the tubular body facing and spaced axially away from the outlet and intersecting the central axis, the tubular body having a K factor greater than 9 and the deflector being shaped and positioned to transform water discharged horizontally from the outlet upon release of the closure by the trigger into a spray pattern of water droplets dispersed over a generally horizontal, generally rectangularly-shaped extended coverage area of ~~at least two hundred and~~ *more than one-hundred* ~~fifty-six~~ *located* square feet on one side of the sprinkler in an amount and with a distribution effective to control an ordinary hazard fire in the coverage area.

2. The sprinkler of claim 1, wherein the tubular body has a K factor of between 10 and 13, both inclusive.

3. The sprinkler of claim 2, wherein the K factor is between 11 and 12, both inclusive.

4. The sprinkler of claim 1, wherein the trigger is a liquid-filled glass bulb.

Sub H1 5. ~~The sprinkler of claim 1, wherein the at least generally rectangularly shaped coverage area receiving water from said sidewall sprinkler is~~

fifty-six
a up to ~~at least~~ two hundred and ~~eighty-four~~ square feet in size.

6. The sprinkler of claim 5, wherein the at least generally rectangularly shaped coverage area receiving water from said sidewall sprinkler is
a up to ~~at least~~ three hundred and twenty square feet in size.

sub 3
a *size* 7. The sprinkler of claim 1, wherein the at least generally rectangularly shaped coverage area is more than three hundred and twenty square feet in ~~area~~.

8. The sprinkler of claim 7, wherein the at least generally
a rectangularly shaped coverage area is ~~at least up to~~ *up to* three hundred and eighty-four square feet in size.

9. The sprinkler of claim 1, wherein the coverage area is at least sixteen feet by sixteen feet square.

10. The sprinkler of claim ~~9~~, wherein the coverage area is up to ~~at least~~ *about* sixteen feet by eighteen feet in size.

11. The sprinkler of claim ~~10~~, wherein the coverage area is up to sixteen feet by twenty feet in size.

a 12. The sprinkler of claim 1, wherein the coverage area is sixteen feet by ~~at least~~ *up to* twenty feet in size.

a 13. The sprinkler of claim ~~12~~, wherein the coverage area is sixteen feet *by* ~~up to~~ twenty-four feet in size.

a 3 14. The sprinkler of claim 1, wherein the deflector comprises an at least generally planar face portion positioned facing and spaced axially away from the outlet along the central axis so as to at least perpendicularly intersect the column of water issuing from the outlet along the central axis and a canopy portion supported on one side of the face portion spanning the face portion, the canopy portion being generally parallel with the central axis and perpendicular to the face portion, the deflector being configured to deliver water to the coverage area in a density of at least ___ gallons per minute/ft² to achieve a generally planar spray

pattern of water droplets generally parallel to a major side of the canopy portion facing the central axis, the spray pattern extending at least sixteen feet beyond the face portion and at least eight feet to either lateral side of the central axis when the sprinkler is positioned with the central axis horizontal and the major side of the canopy portion facing the central longitudinal axis generally horizontal and above the central longitudinal axis whereby said ceiling sprinkler is effective in controlling ordinary hazard fires over a coverage area of at least sixteen feet by sixteen feet when pressurized to supply water at a rate of between 0.15 and 0.20 gallons per minute/ft² times the size of the coverage area in square feet.

Sub Gp 15. The sprinkler of claim 14, wherein the coverage area is at least three hundred and twenty square feet.

16. The sprinkler of claim 14, wherein the coverage area is at least three hundred and eighty-four square feet.

17. The sprinkler of claim 1 wherein when paired with an identical extended coverage sprinkler the deflectors of the identical pair of the sidewall sprinklers being configured such that when the pair of identical sprinklers are identically arranged side by side spaced with central axes parallel and horizontally coplanar and at least sixteen feet apart at or within two feet of a generally smooth ceiling parallel to the central axes and at least coextensive in size with a collection area between the pair of sprinklers, the collection area and the ceiling being as wide as the spacing between the central axes and at least sixteen feet long, and water is supplied simultaneously to each of the pair of sprinklers at a common pressure sufficient to flow through each sprinkler at a discharge rate equal to the collection area between the sprinklers in square feet times a discharge density of 0.15 GPM/ft², the water is actually delivered by the pair of sprinklers to the collection area between the pair of sprinklers at a height no more than six feet seven and one-half inches beneath the canopy portions of the deflectors at an average density of GPM/ft², that two-foot square portions of the collection area entirely across the

collection area receive water at an average density of at least GPM/ft² and that each square foot of the collection area receives water at a rate of at least 0.02 GPM.

18. The sprinkler of claim 17 in which the pair of identical sprinklers deliver water at a density of at least 0.03 GPM to each square foot of the collection area, when the four sprinklers are supplied with water at the selected discharge density.

19. The sprinkler of claim 17 wherein the area collection is located only three feet beneath the canopy portions of the pair of sprinklers.

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